

Number of Wings

by Leon Bennett

Monoplane? Biplane? Sesquiplane? Whatever? Which way does logic point? The answer is messy, for it depends on the value we assign to such factors as model strength and car trunk clearance as compared to endurance and high contest scores. In the end, personal judgement matters much more here than aerodynamics. Even so, pondering the matter can be very useful. Let's do so

Mother Nature does not like wing tips. Each working tip costs us heavily by creating drag through vortices originating at the tip itself and extending downstream. As a result, triplanes are much less efficient than monoplanes. The practical result is to lower trip lane glide ratio and to increase trip lane power consumption in climb, Why then were real triplanes so well regarded in WW I?

There were compensating advantages in terms of maneuverability (speed of rolling or banking, for one) and also in terms of wing strength. Designers were able to use multiple wings in truss fashion, with structural members spaced between wing pinions to create a truly strong result capable of defying bullets and crashes.

In our case, fast banking is no advantage and may even lead to spiral instability. Secondly, extremely strong, rigid wings, while useful, aren't a must. Finally, the short chord of most triplane wings implies a low Reynolds number, signifying an additional burden of inferior aerodynamics, In short, for modelers the triplane offers built-in' disadvantages without compensating advantages.

To supply some incentive, the current FAC bonus points for "more than two wings" amounts to 20 seconds - a great many indeed, and most helpful in leveling the playing field. However, noting that a low wing monoplane is granted 10 seconds (points), we suspect that the overall score advantage still goes to the monoplane.

Why build a triplane? There is an advantage in their reduced span. For those interested in Jumbo scale, legal triplanes begin at 30 inch span, and monoplanes at 36 inches. Thus, a smaller trip lane model can still qualify as a Junbo. Next, dividing wing area into three basic units usually results in a smaller span. That is, triplanes are inherently smaller spanwise. This can be useful in dealing with the space requirements of a small aptment house elevator or a tiny car.

Sesquiplanes are biplanes with tiny lower wing panels, suited for bracing the main wing rather than generating significant lift. Granted full biplane bonus points, they represent an interesting way of going multi. One can do worse.

Which is best? It depends on how you rate size, glide and strength. Even neatness has a say, with multis more demanding of building accuracy. Most of my models have been low wing monoplanes, a vote for simplicity and a good glide. For my money, I go along with Leon as far as monoplanes are concerned, but fully agree with Dave Stott that nothing beats the sight of a biplane floating around overhead in a nose high attitude - Editor.

Via the Jul/Aug 2009 issue of the FAC News